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Stacy, II et al.

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(54) **METHODS AND SYSTEMS FOR DRILLING BOREHOLES**

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This patent is subject to a terminal disclaimer.

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(52) **U.S. Cl.**
CPC ***E21B 44/04*** (2013.01); ***E21B 7/00*** (2013.01); ***E21B 44/00*** (2013.01)

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See application file for complete search history.

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(57) **ABSTRACT**

A system for drilling a borehole according to the present invention includes a drill rig and a control system. The drill rig includes a drill, an air injection system and a water injection system. The control system, which is operatively associates with the drill rig, receives information from the drill rig that relates to at least one drill parameter. The control system processes information relating to the drill parameter, determines whether the drill parameter is within a predetermined specification for the monitored drill parameter, chooses a hole defect mitigation routine based on the monitored drill parameter when the monitored drill parameter is outside the predetermined specification, and controls the drill rig to implement the chosen hole defect mitigation routine.

12 Claims, 16 Drawing Sheets